ROANE COUNTY SOLID WASTE DEPARTMENT

DECISION MAKING ANALYSIS
PURCHASE OF HORIZONTAL BALER

JANUARY 2014

EXECUTIVE SUMMARY # 9E

This analysis was prepared as the county considered purchasing a new baler. The county analysis was inconclusive on whether we should try and extend the life of the old baler or purchase a new baler recognizing that a new baler would be needed in the near future.

The county applied for and received a grant to purchase a new baler and will proceed in the procurement process.

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INTRODUCTION

Purpose

•Research need for replacing the current baler

Analysis will be:

•Recycling growth and revenue expectations
•Current baler operating specifications
•Current baler expense/maintenance cost
•New baler operating specifications
•New baler production based on projected recycling and revenue growth and the current 2013-2014 capital for purchase
•Maintenance and warranty on a new baler.

CURRENT BALER PHOTO

- Operation Speed: 45 minutes per bale
- Bale Size: 60”x30”x48”
- Cycle Time: 40 seconds

11/26/13

CURRENT
RECYCLING WEIGHTS AND REVENUE

The following slide shows the 2013-14 projected revenue of materials currently processed with the existing baler.

These materials are:

- #1 Plastic
- #2 Plastic
- old corrugated cardboard (OCC)

It should be noted that OCC and white paper/news print are baled separately; however, when purchased by the vendor the price varies depending on the amount of newsprint and white paper mix.

CURRENT
RECYCLING WEIGHTS AND REVENUE

Data for 07/01/2011 – 06/30/2012

Products Baled	Current Annual Tonnage 2012	Conversion of Tons to Pounds	Estimated Average Selling Price Per Pound 2012	Estimated Average Selling Price Per Ton 2012	Estimated Annual Revenue 2012	Total Revenue 2012
Plastic #1	33	**66,000**	$0.22	$430.00	$14,190.00	$20,636.66
Plastic #2	14	**28,000**	$0.16	$320.00	$4,480.00	$10,319.04
OCC	662	**1,324,000**	$0.05	$95.00	$62,890.00	$97,734.55
				Total=	**$81,560.00**	$128,690.25

- Includes all recyclable materials that must be baled for purchase.
- Weights and revenue compiled from end of physical year 2012.

CURRENT BALER OPERATING SPECS INTRODUCTION

The current baler operating specifications, listed on slide 8, is gathered from production results that are in the Annual Progress Report that is submitted to the State.

Includes:

- Estimated cost of yearly maintenance
- Pounds of OCC per Bale
- Manual time for applying binding wire
- Baler operation speed
- Bale size
- Cycle time

* Cycle time is the amount of time it takes the baler to compact the material.

CURRENT BALER AND CONVEYER

Conveyer Operating Specs:

- Height: 10’ conveyer dump
- Length: 15’ between pulley centers
- Pulley: 10” diameter
- Hopper: 1 cubic yard, 42 5/8” loading height
- Reinforced 10 gauge steel 3”x4” steel tube frame
- 3/8” steel and sections for pulley and motor mounting

CURRENT BALER OPERATING SPECS AND ANNUAL ESTIMATED MAINTENANCE COST

(Manual Tie)

OPERATING SPECS

- Pounds of plastic per bale- 800
- Pounds of OCC per bale- 1,200
- Operation speed per bale- 45 minutes
- Bale size- 60”X30”X48”
- Cycle time- 40 seconds
- Time applying baling wire per bale- (MANUAL) 30 minutes

ANNUAL ESTIMATED MAINTENANCE COST

- Annual Estimated Cost of Maintenance per year- $10,000
- Labor cost for applying baler wire per bale- $13.00

2 full-time employees, Michael Dunn employees

BALE OF OCC

BALE OF OCC/PAPER

ESTIMATED COST OF MAINTENANCE AND LABOR FOR CURRENT BALER

Labor maintenance and safety are the liabilities associated with the current baler. The following slide illustrates the current cost for labor and maintenance. Labor cost is based on the number of days the baler is in operation times the hourly rate per employees which sums up the current labor cost per year at $80,688 plus maintenance cost of $10,000 for a total of $90,688.

ESTIMATED COST OF MAINTENANCE AND LABOR FOR CURRENT BALER

Estimated Maintenance

- $10,000 maintenance cost for current baler per year

Estimated Labor

- 7 bales produced per day x 246 working days per year = 1722 bales per year

- 1 Full-time employee at $13 per hour x 8 hours = $104 per day
- 1 full-time employee at $12 per hour x 8 hours = $96 per day
- 3 Michael Dunn employees $16 per hour x 8 hours = $128 per day
- Total labor expense per day = $328 ($1,640 per week)

- 246 working days per year x $328 labor per day = $80,688 labor per year.

- TOTAL EXPENSE PER YEAR
  $10,000 + $80,688 = $90,688

CURRENT BALER PRODUCTION WITH FUTURE RECYCLING GROWTH

The calculation for the future growth of our recycling efforts in Roane County were gathered through extensive research that includes the data submitted in the Annual Progress Reports over the past five years, the CTAS/CIS report that was completed in May of 2013 and the projections of the Director of Solid Waste, Ralph Stewart. Also, Director Stewart and Jack Jinks have made numerous site visits and interviewed other Solid Waste Directors who have had great success in their programs.

As of November 2013, Roane County has again applied for the Hub and Spoke Grant. The application process for the grant guarantees by resolution or ordinance by selected cities and adjoining counties participates in our recycling efforts. We have also added one additional school to our recycling family which brings us to six county schools who are contributing to our recycling efforts. The following slide shows the estimated growth percentage from 2014 at 10% growth to 2018 at an estimated 45% growth. There is no scientific way to estimate. The growth, this is a projection based on available information.

CURRENT BALER PRODUCTION WITH ESTIMATED FUTURE RECYCLING GROWTH

Products Baled	2013 Estimated Percentage Growth of Tons 5%	2013 Estimated Growth of Revenue 5%	2014 Estimated Percentage Growth of Tons 10%	2014 Estimated Growth of Revenue 10%	2015 Estimated Percentage Growth of Tons 8%	2015 Estimated Growth of Revenue 8%	2016 Estimated Percentage Growth of Tons 9%	2016 Estimated Growth of Revenue 9%	2017 Estimated Percentage Growth of Tons 8%	2017 Estimated Growth of Revenue 8%	2018 Estimated Percentage Growth of Tons 10%	2018 Estimated Growth of Revenue 10%
Plastic #1	35	$14,900.00	38.5	$16,390.00	41.58	$17,701.20	45.24	$19,294.30	48.86	$20,837.84	53.75	$22,921.00
Plastic #2	15	$4,704.00	16.5	$5,174.40	17.82	$5,588.40	19.42	$6,091.36	20.97	$6,579.00	23.07	$7,237.00
OCC	695	$66,034.50	764.5	$72,637.95	825.66	$78,449.00	900	$85,509.41	972	$84,724.92	1069.2	$93,197.41
TOTAL	**745**	**$85,638.50**	**819.5**	**$94,202.35**	**885.06**	**$101,738.60**	**964.66**	**$110,895.07**	**1041.83**	**$112,141.76**	**1146.02**	**$123,355.41**

- Includes all recyclable materials that must be baled for purchase.
- Estimated growth is figured by percentage added to each year total showing increase for each year.

CURRENT BALER FAILURE AND RECOVERY

Scenario #1:

In the case of a malfunction in the bailing process two directions can be taken. This slide represents the land filling and associated cost. The scenario is based on two weeks. There are approximately thirty-five bales of product made each week; Two plastic bales (1600 lbs/0.8 tons) and Thirty-three bales of OCC/paper (39,600 lbs/19.5 tons)

Transport expense to landfill:

As non-baled material, plastic accumulates approximately three 40-yard boxes and cardboard accumulates approximately nineteen 40-yard boxes that would be transported to the landfill.

- $120 per transport x 22 transports per week = $2640 per week
- Tipping fee is currently $19 per ton x 20 tons = $385 per week
- Total weekly transport $2640 + total weekly tipping fee $385= $3025 per week total
- 2 week total transport to landfill expense = $6050

Lost revenue at 2 weeks:

For two weeks four bales of plastic would bring approximately $480 and 64 bales of OCC would be $576 that brings the revenue loss to $1,056 that brings your net loss to $6,336.

Money is not the only factor involved. The State closely monitors our waste stream effort; grants are heavily weighted toward those who continue high recycle efforts.

CURRENT BALER FAILURE AND RECOVERY

Scenario #2

Storage of material at recycle center for two weeks

This scenario involves storing the recyclable material on site for one week. With the space available and the material not packaged but loose, one week would reach our maximum available storage capacity. Again using the two week down time, the labor cost would increase by having to use an additional shift to catch up. The capacity of material would be the same as above so transportation cost would increase with the addition of an extra truck. The material could not be left at the convenience centers for lack of storage space and containers.

Labor cost for the normal staff of three Michael Dunn employees and our two full time workers is $1,640 per week and one truck driver is $560 per week totaling labor and transportation costs to $2,200 per week. Adding the second week, with no overtime, would bring our labor and transportation cost to $4,400. Overtime pay will be the total labor cost per week $1640 + half the total labor cost per week $820 = $2460 overtime per week. Total overtime for 2 weeks = $4920.

The advantage in this scenario is there is no lost revenue with the recycle materials. The risk is the avoidance of overtime pay.

CURRENT STORAGE AREA BEFORE PROCESSING

NEW BALER OPERATING SPECS

There has been no decision made on what make or model baler would best meet our needs although research has shown some specifications that would best fit our operation.

The baler should be capable of:
- 1,200 pound bale of plastic
- 1,800 pound bale of OCC
- 450 pound bale of aluminum
- automatic tying of wire
- operation speed of 20 minutes
- approximate bale size of 30”X45”X72”
- cycle time of 10 to 11 seconds.

NEW BALER OPERATING SPECS

- Pounds of plastic per bale- 1200
- Pounds of OCC per bale- 1800
- Pounds of Aluminum per bale - 450
- Annual estimated cost of maintenance- 2 year warranty
- Time applying baler wire per bale- (Automatic) 2 minutes
- Labor costs for applying baler wire- $0
- Operation speed per bale- 20 minutes
- Bale size- 30”X45”X72”
- Cycle time- 10.57 seconds

BALE OF PLASTIC

BALE OF ALUMINUM CANS

CURRENT BALER VS NEW BALER

Comparing the efficiency of the new baler compared to the current baler. The life expectancy of a new unit is 20 years.

CURRENT BALER VS NEW BALER							
BALER	POUNDS OF PLASTIC PER BALE	POUNDS OF ALUMINUM	POUNDS OF OCC PER BALE	TIME APPLYING BALER WIRE PER BALE	OPERATION SPEED PER BALE	BALE SIZE	CYCLE TIME SECONDS
CURRENT BALER	800	NOT CAPAPBLE	1200	MANUAL: 30 MINUTES	45 minutes	60"X30"X48	40
NEW BALER	850 - 1000	450	1800	AUTO: 2 MINUTES	20 minutes	30"X45"X72"	10.57

*New baler will bale aluminum cans, the current horizontal baler is not capable of.

CURRENT BALER VS NEW BALER COST ESTIMATES

CURRENT BALER VS NEW BALER			
BALER	**ANNUAL ESTIMATED COST OF MAINTENANCE**	**LABOR COST FOR APPLYING BALER WIRE PER BALE**	**ESTIMATED COST OF BALER**
CURRENT BALER	**$10,000**	**$13.00**	**REFURBISH CURRENT BALER: $15, 320.88**
NEW BALER	**2 year warranty**	**$0.00**	**NEW: (shipped & installed) $185,000.00**

CURRENT ALUMINUM CAN VERTICAL BALER SPECS

- Material baled- Aluminum
- Bale size- 60”x45”x30”
- Bale weight- 350 pounds
- Cycle time- 40 seconds
- Time applying baling wire- 4 minutes
- 1 bale takes approximately 2 hours to produce

The current horizontal baler is not capable of baling aluminum cans. The new baler will be used to bale aluminum cans the current vertical baler will be used to bale thin film plastics, such as used grocery bags, which we do not recycle currently.

*Baler was purchased in 2007 for $9050.

Current vertical baler used for aluminum cans. 11/26/13

CURRENT BALER EXPENSE REFURBISH

In September 2013, HWI Equipment provided a quote to Roane County Solid Waste to refurbish the current baler with a total of $15,320.88.

Current baler was purchased in 1997.

***Scrap price for current baler is estimated at $1,000 - $1,500. Resale (trade-in for new baler) price is approximately $5,000.**

MATERIAL	PRICE
Travel, Labor, Meals and Lodging	$4,760.00
Wire and Conduit	$350.00
HP-1253 Cylinders x2	$5,176.00
A-2100 Cylinder Pin Field Kit x4	$759.00
M-2023 Lower Bearings	$100.00
M-2034 Top Side Bearings x2	$136.00
M-2025 Rear/Bottom/Side Bearings x6	$466.68
M-1614 Wear Plates x2	$342.62
M-1056 Shear Edge x1	$355.28
P-1037 Bolts x5	$13.79
S-1010 Glide Retainer x2	$480.00
P-1029 Bolts x4	$8.52
SK-1001 Proximity Safety Switch update x1	$557.27
EP-2554 Disconnect x1	$729.72
HP-1049 Oil Filter x1	$65.00
HP- 1015 Breather Cap x1	$36.00
EP- 1935 Contactor x1	$430.92
EP-1948 Overload x1	$145.60
EP-1146 Fuse x3	$407.10
Total- Excluding Shipping and Handling	$15,320.88

NEW BALER EXPENSE PURCHASE AMOUNT

Estimated purchase amount is $185,000 in capital budget for purchase of new baler 2013-14.

Grants

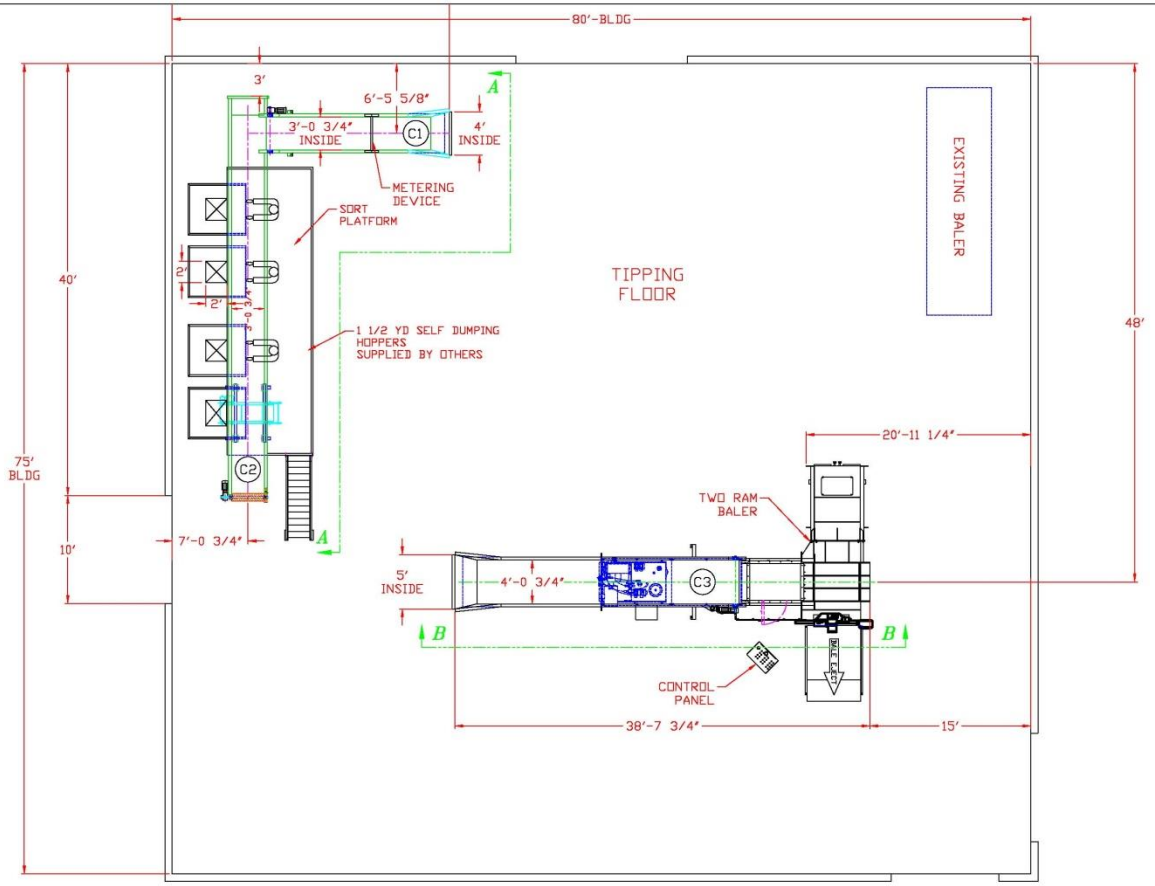
Hub and Spoke grant has again been applied for.

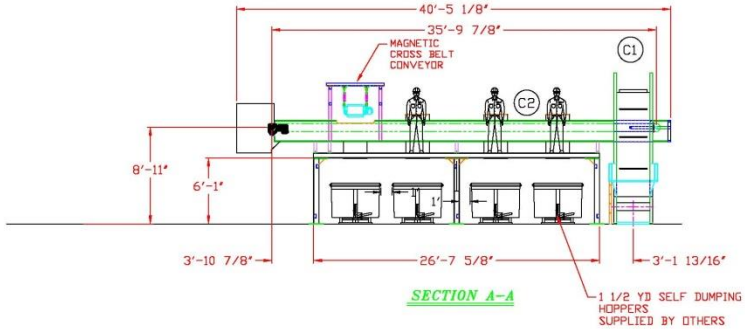
PROPOSED FUTURE BALER

BALER PLACEMENT DIAGRAM

- While researching found a number of baler site layouts.
- The CIS/CTAS study also suggested the best site layout plan for our current space.
- The diagram was submitted by Marathon Equipment Company, a vendor for baler sales.
- Site plan fits our current space with the possible addition of a conveyer supply system.
- Placement of current baler

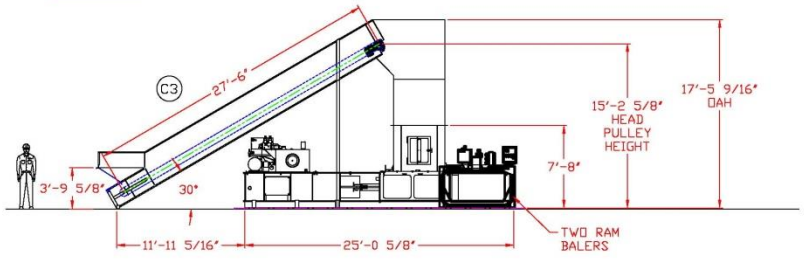
LEGEND	
C1	SB-M-36-18-200-12-AG-B-35-3
C2	SB-M-36-36-200-3-S-A-0-3
C3	SB-M-48-27.5-200-15-AG-B-30-3
	2R-150-57-N-50 TWO RAM BALER
	36" CROSS BELT MAGNET





SECTION A-A

PLAN VIEW



SECTION B-B

TITLE:
SMALL RECYCLING SYSTEM
FOR ROANE CO TN

THIS IS NOT AN APPROVAL DRAWING

THIS DRAWING IS FOR PROPOSAL PURPOSES ONLY. DETAILS ARE SUBJECT TO CHANGE DURING APPROVAL/DESIGN PROCESS.

NOTE:
THIS DRAWING IS AN ACCURATE DEPICTION OF EQUIPMENT PROVIDED BY MARATHON ONLY. ANY REPRESENTATION OF BUILDING AND OTHER EQUIPMENT ARE FROM BEST AVAILABLE INFORMATION AND MAY OR MAY NOT BE ACCURATE. DIMENSIONS MAY CHANGE UP ON ACTUAL DESIGN

MARATHON
VERNON AL.
YERINGTON NV.
CLEARFIELD PA.

DR. DC	
CK.	APP.
DATE: 11/15/13	
SCALE:	
TOL: ±1/16"	
DRAWING NO.	
69851-C	

SUMMARY

The purpose of this Decision Making Analysis is to research and compare the decision to purchase a new baler for our recycle operation. Understanding our recycling operation is going to expand based on our efforts and State and Federal guidelines. We need to be prepared to meet those needs. The age of our current baler and the continuing maintenance cost are also a concern. The analysis shows the unintended consequences that would occur if our baler were to be out of service for one to two weeks. The removal of additional recycling material from the waste stream showcases our counties ability to stay ahead of others and puts us in the lead for additional grants as well as recognition from Federal programs. The baler purchase is a budgeted capital item and this analysis shows the importance and use for this piece of equipment.